

Patent Claims

1. Method of populating a carrier tape with components, which has the following steps:

- 5 - providing a carrier tape (6) with passage openings (63) for a packaging system (2) for populating the carrier tape (6) with components (10),
- picking up individual components (10) from a support table (22) arranged underneath a guide plate (21) of the packaging system (2) by means of a vacuum pipette
10 (42),
- lifting the component (10) into one of the passage openings (63) in the carrier tape (6) by means of a vertical lifting movement of the vacuum pipette (42),
- 15 - wiping the component (10) off the vacuum pipette (42) by means of the carrier tape (6),
- picking up the component (10) and the carrier tape (6) as they are wiped off the vacuum pipette (42) by means of an upper guide (31) and by means of a lower
20 guide (32),
- closing an upper side (61) of the tape by applying an upper cover film (64),
- closing an upper side (62) of the tape by applying a lower cover film (65).

25

2. Method according to Claim 1, characterized in that the components (10) are lifted from below by a lifting needle (43).

- 30 3. Method according to Claim 1 or 2, characterized in that the vacuum pipette (42) and the lifting needle (43) carry out a vertical lifting movement through a first opening (23) in the guide plate (21).

- 35 4. Method according to one of Claims 1 to 3, characterized in that at least the vacuum pipette (42) carries out a horizontal movement in the conveying

direction (C) of the carrier tape (6) as it inserts a component (10) into a passage opening (63) in the said carrier tape (6).

5 5. Method according to one of Claims 1 to 4, characterized in that the lower cover film (65) is applied underneath a vacuum suction device (27), which prevents the components (10) falling out of the passage openings (63) in the carrier tape (6).

10

6. Method according to one of Claims 1 to 5, characterized in the upper and lower cover film (64, 65) are applied by means of a heating device (28) in an adhesive manner to the upper side (61) of the tape and
15 to the underside (62) of the tape.

7. Method according to one of Claims 1 to 6, characterized in that the upper and the lower cover film (64, 65) are adhesively bonded to the upper side
20 (61) and underside (62) of the tape.

8. Method according to one of Claims 1 to 8, characterized in that the carrier tape (6) used is a paper tape which has passage openings (63) to hold
25 components (10).

9. Packaging system having a guide plate (21) for the linear guidance of a carrier tape (6) that can be populated with components (10), a passage opening (23)
30 being provided in the guide plate (21), and the packaging system (2) having a carrier-tape populating tool (4) with the following features:

- the carrier-tape populating tool (4) has a vacuum pipette (42) and a lifting needle (43),
- 35 - in each case a lifting movement can be carried out by the vacuum pipette (42) and/or by the lifting needle (43),

- the lifting needle (43) and/or the vacuum pipette (42) can be moved in and/or through the passage opening (23) in the guide plate (21),
the packaging system (2) further having at least one
5 upper cover film device for applying an upper cover film (64) and/or a lower cover film device for applying a lower cover film (65).

10. Packaging system according to Claim 9,
10 characterized in that the vacuum pipette (42) has a lifting direction at right angles to the conveying direction (C) of the carrier tape (6) and through the passage openings (63) in the latter.

15 11. Packaging system according to Claim 9 or 10, characterized in that the lifting needle (43) has a lifting direction (B) at right angles to the conveying direction (C) of the carrier tape (6) and as far as the lower edge of the passage openings (63) in the latter.

20 12. Packaging system according to one of Claims 9 to 11, characterized in that the lifting movements of the vacuum pipette (42) and of the lifting needle (43) are in each case synchronised.

25 13. Packaging system according to one of Claims 9 to 12, characterized in that the vacuum pipette (42) has a horizontal movement component in the same direction as the conveying direction (C) of the carrier tape (6).

30 14. Packaging system according to one of Claims 9 to 13, characterized in that the components (10) are applied to a component carrier or a blank (8) in rows and/or in columns, and are held together by a carrier
35 film (81).

15. Packaging system according to Claim 14, characterized in that the component carrier or the blank (8) with the carrier film (81) is applied to a support table (22) that can be displaced horizontally.

5

16. Packaging system according to Claim 15, characterized in that the support table (22) can be displaced in a first horizontal direction parallel to the conveying direction (C) of the carrier tape (C) and
10 in a second horizontal direction at right angles thereto.

17. Packaging system according to Claim 15 or 16, characterized in that the support table (22) has a
15 second opening (24) of greater diameter than the lifting needle (43), which can in each case be brought into a position located vertically underneath a passage opening (63) in the carrier tape (6).

20 18. Packaging system according to one of Claims 9 to 17, characterized in that the guide plate (21) has a first opening (23) of greater diameter than an outline of a component (10), through which opening the linear lifting axes of the vacuum pipette (42) and of the
25 lifting needle (43) extend centrally.

19. Packaging system according to one of Claims 9 to 18, characterized in that the packaging system (2) has a feed device (25) for the upper cover film (64) behind
30 the pick-up device (41) in the conveying direction (C) of the carrier tape (6).

20. Packaging system according to one of Claims 9 to 19, characterized in that the packaging system (2) has
35 a feed device (26) for the lower cover film (65) behind the pick-up device (41) in the conveying direction (C) of the carrier tape (6).

21. Packaging system according to one of Claims 9 to
20, characterized in that the feed device (26) for the
lower cover film (65) is arranged behind the feed
5 device (25) for the upper cover film (64) in the
conveying direction (C) of the carrier tape (6).

22. Packaging system according to one of Claims 9 to
21, characterized in that a vacuum suction device (27)
10 is provided above the feed device (26) for the lower
cover film (65), to raise the electronic components
(10) into their passage openings (63).